



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/762,690	01/22/2004	Darwin V. Ellis	60.1527 US NP	5254
37003	7590	01/22/2007	EXAMINER	
SCHLUMBERGER-DOLL RESEARCH ATTN: INTELLECTUAL PROPERTY LAW DEPARTMENT P.O. BOX 425045 CAMBRIDGE, MA 02142			TAYLOR, VICTOR J	
		ART UNIT	PAPER NUMBER	
		2863		
SHORTENED STATUTORY PERIOD OF RESPONSE		MAIL DATE	DELIVERY MODE	
3 MONTHS		01/22/2007	PAPER	

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/762,690	ELLIS ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Victor J. Taylor	2863	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) Responsive to communication(s) filed on 20 July 2006.
- 2a) This action is **FINAL**.                                    2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) Claim(s) \_\_\_\_\_ is/are allowed.
- 6) Claim(s) 1-19 is/are rejected.
- 7) Claim(s) \_\_\_\_\_ is/are objected to.
- 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 20 July 2006 is/are: a) accepted or b) objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
 a) All    b) Some \* c) None of:
  1. Certified copies of the priority documents have been received.
  2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)	4) <input type="checkbox"/> Interview Summary (PTO-413)
2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)	Paper No(s)/Mail Date. _____
3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____	5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)
	6) <input type="checkbox"/> Other: _____

## **DETAILED ACTION**

1. Claims 1-19 are pending in the instant application. Therefore, claims 1-19 are presented for examination.

### ***Drawings***

2. The corrected drawings were received on 20 July 2006. These drawings are approved.

### ***Information Disclosure Statement***

3. The information disclosure statement (IDS) was submitted on 1 October 2004. This submission is in compliance with the provisions of 37 CFR 1.97. Accordingly, the examiner is considering the information disclosure statement.

### ***Response to Arguments***

4. Applicant's arguments see the response, filed 20 July 2006, with respect to drawings and applicant arguments/remarks have been fully considered and are persuasive. The notice of non-compliant amendment under 37 CFR 1.121 of 20 July 2006 is now moot and has been withdrawn.

Therefore the amendment submitted on 15 June 2006 has now been entered into the instant application.

5. Applicant's arguments, see the amendments, filed 15 June 2006, with respect to the objected claims have been fully considered and are persuasive. The objection to the claims of 13 December 2005 is moot and has been withdrawn.

6. Applicant's arguments, see the amendment, filed 15 June 2006, with respect to the rejection(s) of claim(s) 1 and 6-7 and 10-19 under Gzara in US patent 6,768,106 B2 have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Odom et al., in US 6,936,812 B2.

***Specification***

7. The disclosure is objected to because of the following informalities:

The uses of the terms for "long" and "short" in the claims are objected to as being indefinite, wherein the terms are subject to speculative interpretation as to just what can be too "long" or too "short" of a distance in spacing wherein the terms "near" or "nearby" or "close" or "close by" in terms of distance for spacing is indefinite.

Appropriate correction is required and a statement of no new matter is required concerning amendments to the specification.

***Claim Rejections - 35 USC § 101***

8. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

9. Claim 1-19 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory matter.

Claim 1 is drawn to a method of determining formation density using a logging tool on a drill string or a wire line in a borehole using sources and detectors to determine formation density based on the spacing of the detectors wherein steps are developed on calibration relationships utilizing differences between backscattered gamma ray data from the long and short spacing of the detector data and used to determine the correct formation density values using the cased hole calibration relationships and backscattered detector data used the processes by the computation device (10) using parameters and computation methods for optimizing parameters with computation method steps that are internal to the computer and which fail to show the clear concrete and tangible result or provide for data storage on a media or provide useful output to the user.

In addition the claimed limitations provide steps for developing calibration relationships from various spaced detector data with steps of using the calibration relationship data and backscattered data obtained from detectors in the borehole wherein it is not clear just what or how the limitation steps further narrow the method of formation density other than determining relationships by observing backscatter gamma rays or just what steps are used in the using limitation.

For example;

Claim 1 lacks a useful, concrete, and tangible result. The claim is directed to manipulation of ideas that are abstract in nature, as performing of the method does not result in an outcome that is for example, displayed, stored, or outputted to a user etc., by means of a tangible medium. Because there is not a storage

media or outputted data on a display or similar device for output for a user, the claim is non-statutory and comprises computation processes that show no clear concrete tangible result.

For the result to be tangible it would need to output to a user or displayed to a user or stored on data media for later usage. Hence the claims are treated as non-statutory functional descriptive material (See MPEP Section 2106).

Any change in the claim limitations need to find support in the specification and in the drawings. No new matter may be added.

Claims 2-15 are rejected as based on a rejected base claim and the argument for claims 2-15 are applied for at least the reasons cited above.

Claim 8 cites a medium having a program code with means functions for making so claimed calibration and data measurements that are vague and not clear and fail to show clear program steps that are stored on the media and seem to provide a desired result for determining formation density that is not useful, clear and concrete and tangible result.

Claim 8 lacks a useful, concrete, and tangible result. The claim is directed to manipulation of ideas that are abstract in nature, as performing of the method does not result in an outcome that is for example, displayed, stored, or outputted to a user etc., by means of a tangible medium. Because there is not a storage media or outputted data on a display or similar device for output for a user, the claim is non-statutory and comprises computation processes that show no clear concrete tangible result.

For the result to be tangible it would need to output to a user or displayed to a user or stored on data media for later usage. Hence the claims are treated as non-statutory functional descriptive material (See MPEP Section 2106).

Any change in the claim limitations need to find support in the specification and in the drawings. No new matter may be added.

Claim 17 is drawn to a system for computerized well logging for determining formation density using a logging tool on a drill string or a wire line in a borehole using sources and detectors to determine formation density based on the spacing of the detectors wherein steps are developed on calibration relationships utilize differences between backscattered gamma ray data from the long and short spacing of the detector data and used to determine the correct formation density values using the cased holed calibration relationships and backscattered detector data used the processes by the computation device (10) using parameters and computation methods for optimizing parameters with computation method steps that are internal to the computer and which fail to show the clear concrete and tangible result or provide for data storage on a media or provide useful output to the user.

In addition the claimed limitations provide steps for developing calibration relationships from various spaced apart detector data with steps of using the calibration relationship data and backscattered data obtained from detectors in the borehole wherein it is not clear just what or how the limitation steps further narrow the method of formation density other than determining

relationships by observing backscatter gamma rays or just what steps are used in the using limitation.

For example;

Claim 17 lacks a useful, concrete, and tangible result. Wherein the claim is directed to a logging tool and a computer processes module connected on the logging tool commonly found in the well logging art wherein the claim is directed to manipulation of ideas that are abstract in nature, as performing of the method does not result in an outcome that is for example, displayed, stored, or outputted to a user or work station etc., by means of a tangible medium. Because there is not a storage media or outputted data on a display or similar device for output for a user, the claim is non-statutory and comprises computation processes internal that show no clear concrete tangible result.

For the result to be tangible it would need to output to a user or displayed to a user or stored on data media for later usage. Hence the claims are treated as non-statutory functional descriptive material (See MPEP Section 2106).

Any change in the claim limitations need to find support in the specification and in the drawings. No new matter may be added.

Claims 18-19 are rejected as based on a rejected base claim and the argument for claim 17 and claim 1 are applied for at least the reasons cited above.

See MPEP 2106 and United States Patent and Trademark Office Interim Guidelines for Examination of Patent Applications for Patent Subject Matter Eligibility OG Notices: 22 November 2005 and the 101 issues as found in the

inter-net location,

<http://www.uspto.gov/web/offices/com/sol/og/2005/week47/patgupa.htm>.

**Prior Art**

10. The prior art made of record and not relied upon is considered pertinent to applicant.

I. Art A of Watson US 5,350,925 in class 250/269.3 is cited for the method of processing spectra data detected by the gamma ray detector of a borehole tool to provide borehole parameters and discloses the nuclear logging tools in lines 30-50 of column 2.

II. Art B of Case US 5,334,833 in class 250/270 is cited for the function technique for modeling nuclear tool data calculated by a convolution of density sensitivity functions 40 in figure 1 and discloses the Monte Carlo technique in lines 40-60 of column 2.

***Claim Rejections - 35 USC § 102***

11. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) The invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

12. Claims 1-19 are rejected as being unpatentable over Odom et al., in U.S. Patent 6,936,812 B2.

With regard to claim 1, Gzara discloses a method of determining both formation density in a cased borehole environment see line 16 of column 4 with spaced apart gamma detectors 10 in figure 1.

a. He further discloses the steps of "developing one or more cased hole calibration relationships which utilize the differences between the scattered gamma rays observed by the short spacing detectors and the scattered gamma rays from the formation observed by long spacing detectors to determine the corrected formation density values" are disclosed in the analyzed data used to yield the formation density properties using the tool 10 on the drill string 24 in figure 1 wherein the detectors are spaced along an axial axis using a plurality of spacing in line 25 of column 5 wherein the examiner considers the adjustable detector spacing to comprise short and long spacing in the small adjustable spacing in line 27 of column 5 in combination with figure 1.

b. He further discloses the steps of using the "cased borehole calibration relationships and scattered gamma ray measurements obtained by said long spacing detector and said short spacing detector to determine the formation density" in the logging system detectors computer model in lines 15-55 of column 4 in combination with the logging tool in figure 1.

As to claims 2- 6, which stand rejected on the rejected base claim, wherein said logging tool further includes a backscatter detector located between said gamma ray source and said short spacing detector is disclosed in the short spacing backscatter configuration for the short detector 10 in figure 1 and in the adjustable spacing length line 15 column 6.

As to claim 7, which stand rejected on the rejected base claim, wherein said gamma ray source comprises a Cesium-137 source is disclosed installed on the gamma tool 10 in figure 1.

As to claim 8-9, which stand rejected on the rejected base claim, wherein said gamma ray source calibration is disclosed in the two group analysis wherein constant is determined by calibration 150 of tool response see line 5-20 of column 13 with figure 8.

As to claim 10, which stands rejected on the rejected base claim, wherein different said calibration relationships are determined for different cement densities and one or more of determines cement density utilizing the density of the cement pumped at the surface and ultrasonic measurements disclosed by calibration 150 of tool response see line 5-20 of column 13 with figure 8.

As to claim 11, which stands rejected on the rejected base claim, wherein said scattered gamma ray measurements obtained by said long spacing detector and said short spacing detector are corrected for perturbations associated with completion hardware is disclosed by calibration 150 of tool response figure 1.

As to claim 12, which stands rejected on the rejected base claim, wherein said correction is performed by identifying a region associated with said completion hardware (10) and substituting for perturbed samples in this region an average of the values of closest good samples on either side of these perturbed samples is disclosed in figure 1

As to claim 13, which stands rejected on the rejected base claim, wherein said short spacing detector and said long spacing detector each have multiple

energy windows 335 and count rates from lower energy windows associated with said detectors are ignored or underweighted with respect to higher energy windows associated with said detectors as found in the computation processes (26) and acquisition time samples (26) in figure 1.

As to claim 14, which stands rejected on the rejected base claim, wherein further comprising determining a maximum standoff distance been said logging tool and the formation is disclosed in the tool position and the detector location on the tool (10) in relation to the borehole in figure 1.

As to claim 15, which stands rejected on the rejected base claim, wherein further comprising determining when the standoff distance between said logging tool (10) and the formation (22) exceeds said maximum standoff distance is determined in the computer computations (26) in figure 1.

With regard to claim 16, Gzara discloses an article of manufacture with,

- A computer useable medium having a computer readable program code means embodied therein for determining formation density in a cased whole environment, the computer readable program code means in said article of manufacture disclosed in the computer program (26) illustrated in figure 1.

- Computer readable program means for determining formation density in a cased bore hole (20) shown in figure 1 environment using one or more cased hole calibration relationships and measurements made by a logging tool (10) having a gamma ray source, a long spacing detector, and a short spacing detector is disclosed on the bore hole tool in figure 1 all elements.

With regard to claim 17, Gzara discloses a computerized well logging system for determining the formation density in a cased/hole environment. With:

- a. A logging tool having a gamma ray source, a long spacing detector, and a short spacing detector disclosed in the LWD tool (10) in figure 1. And,
- b. A computing module and/or processing circuitry, connected to said logging tool, having means for calculating formation density from gamma ray scattering measurements obtained by said long spacing detector and gamma ray scattering measurements obtained by said short spacing detector using one or more cased hole calibration relationships is disclosed in the surface instrumentation (26) in figure 1 and in combination with the complete patent and in lines 15-65 of column 4.

As to claim 18, which stand rejected on the rejected base claim, wherein said logging tool is suspended by a cable and a swivel allows said logging tool to rotate with respect to said cable (24) is disclosed on the drill string (24) which rotates the tool in figure 1.

As to claim 19, which stand rejected on the rejected base claim, wherein said logging tool has a recommended open hole logging speed and a recommended cased hole logging speed and said recommended cased hole logging speed is at least two times slower than said recommended open hole logging speed is disclosed in the rotation parameters of the LWD tool and is determined by the system control (25) using the top side instruments and control station (26) in figure 1 in combination with the computer and model computer program in combination with the complete patent and in lines 15-65 of column 4.

***Conclusion***

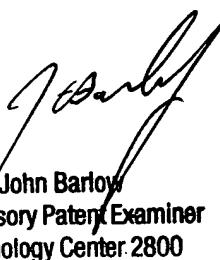
13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Victor J. Taylor whose telephone number is 571-272-2281. The examiner can normally be reached on 8:00 to 5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John E. Barlow can be reached on 571-272-2863. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

V. Taylor

  
7 December 2006.

  
John Barlow  
Supervisory Patent Examiner  
Technology Center 2800